Jan. 19, 1937. B. L. MAXWELL 2,068,241

CARTON CLOSING DEVICE

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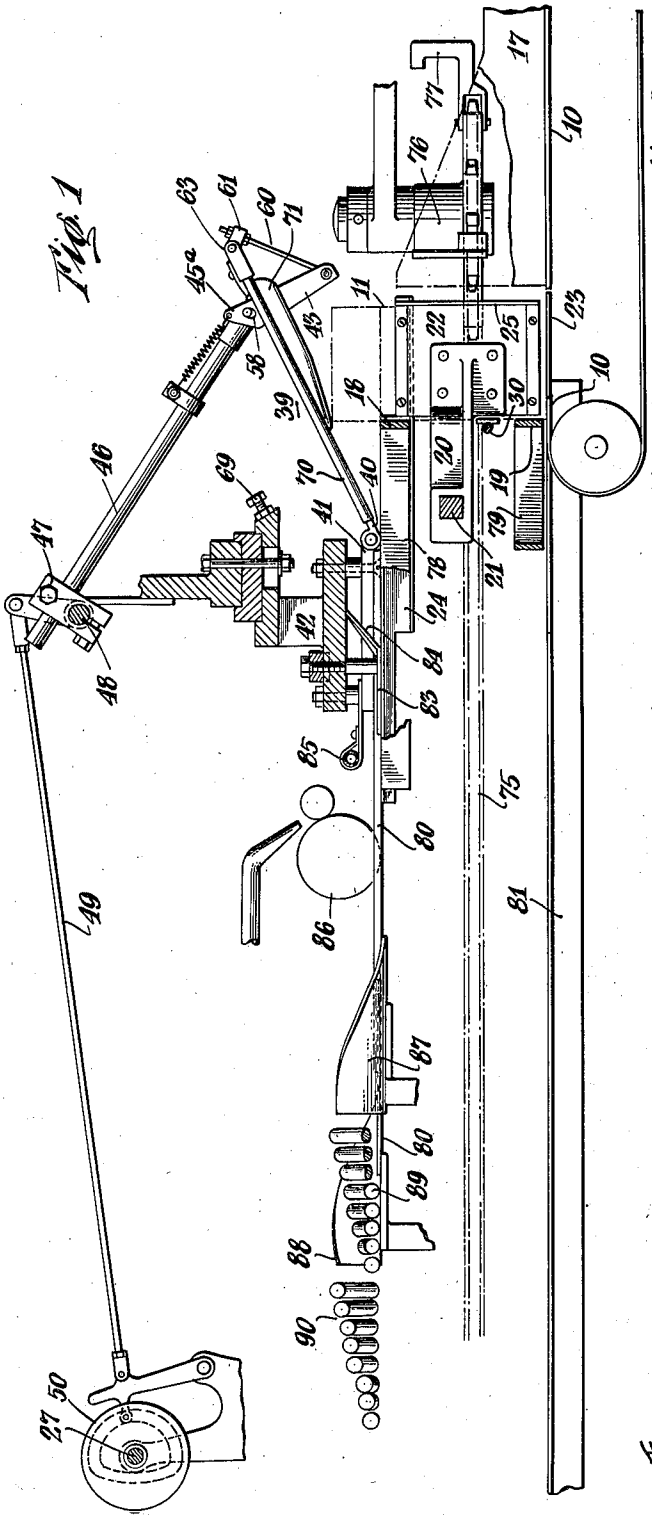


Fig. 1

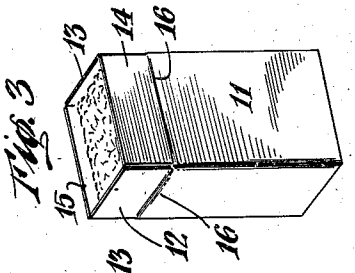


Fig. 3

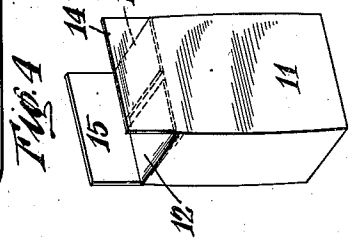


Fig. 4

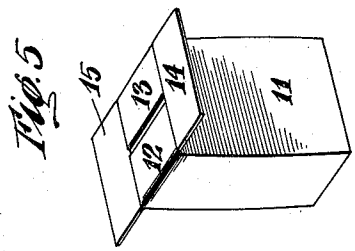


Fig. 5

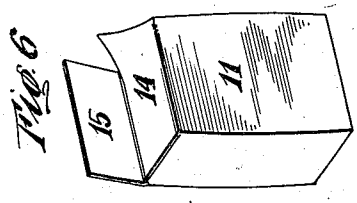


Fig. 6

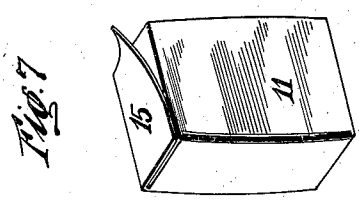


Fig. 7

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CARTON CLOSING DEVICE

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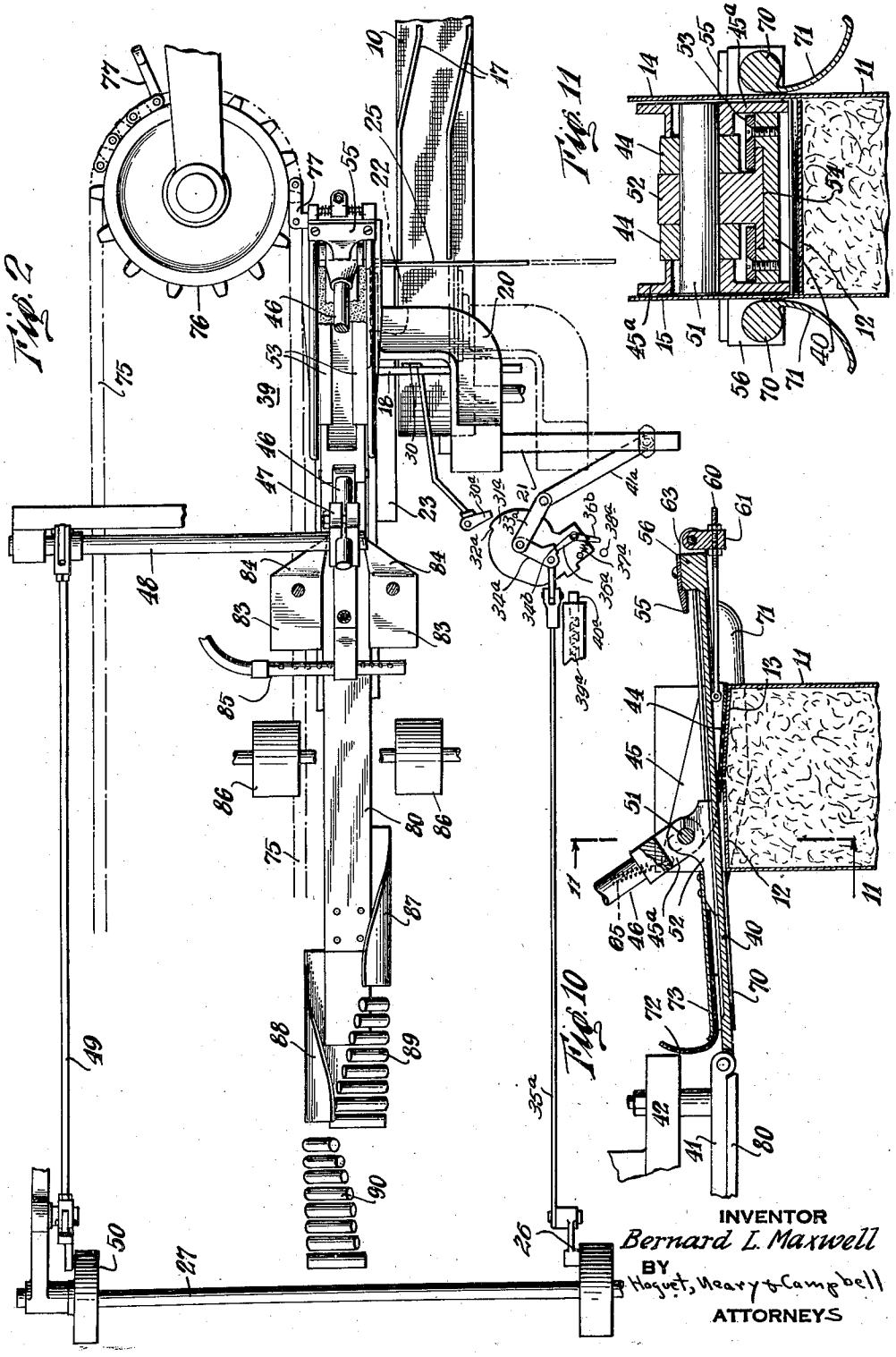


Fig. 2

Fig. 11

Fig. 10

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Fig. 8

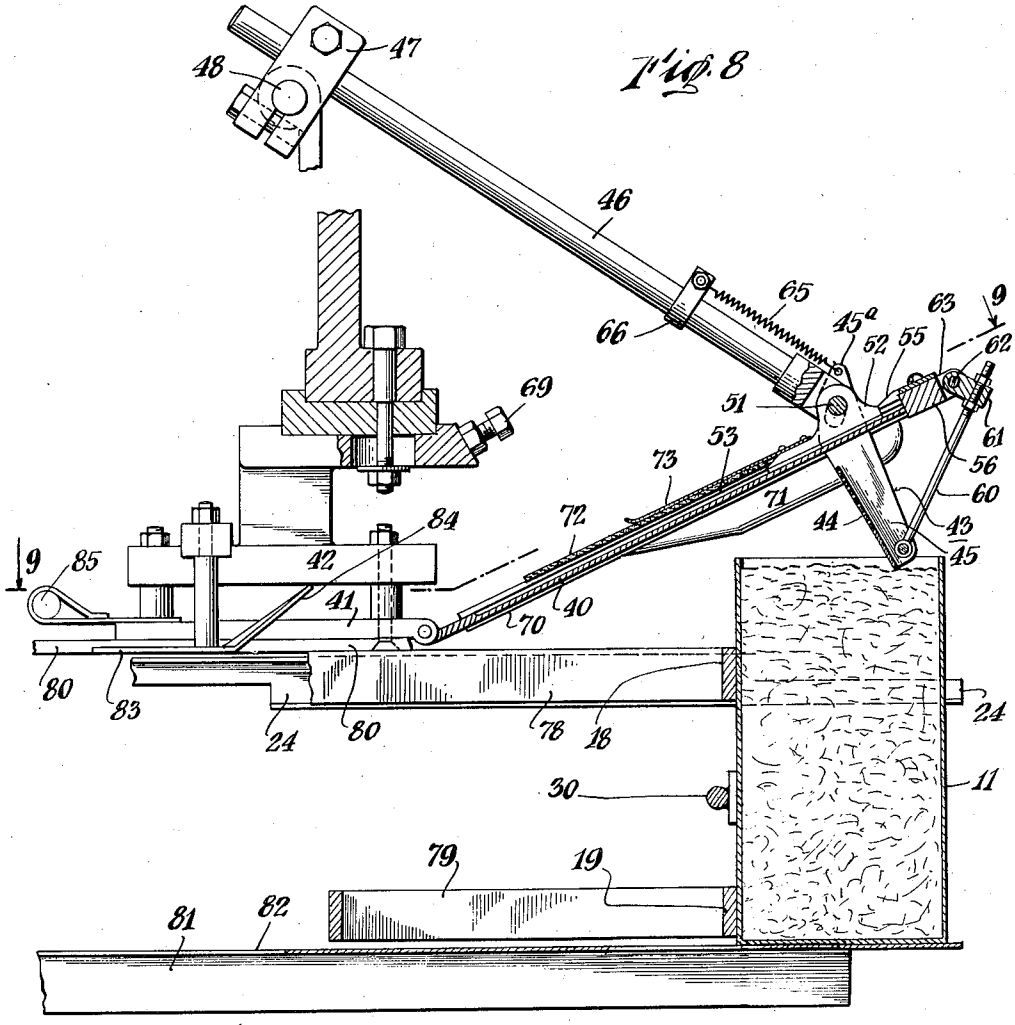
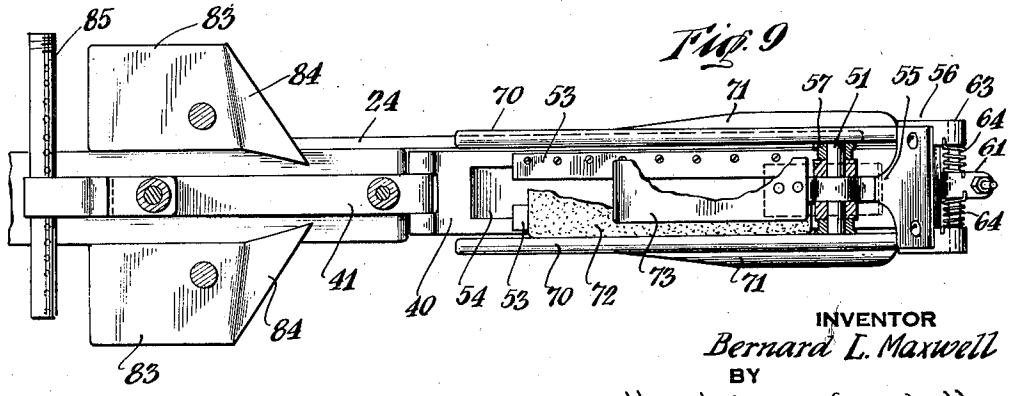


Fig. 9



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UNITED STATES PATENT OFFICE

2,068,241

CARTON CLOSING DEVICE

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Application December 15, 1934, Serial No. 757,633

15 Claims. (Cl. 93—2)

This invention relates to packaging apparatus and particularly to apparatus for closing and sealing cartons.

In merchandising packaged bulky products, such as soap flakes or powders, it has been found that the cartons often reach consumers with the level of the contents noticeably below the top of the carton, sometimes to the extent of a half inch or more, although the cartons were filled to the top before sealing at the factory. This is objectionable and disadvantageous from a sales viewpoint inasmuch as customers on noting that the level of the contents is below the top of the carton may come to the conclusion that they have been given short measure whereas the discrepancy between the capacity of the carton and the quantity of material therein is actually a result of the shrinkage in the volume of the contents due to natural settling thereof after packaging or because of considerable jarring of the cartons while in transit.

To correct this undesirable condition it has been proposed to place a greater quantity of material in the package by heaping it above the top and mechanically compressing the contents to the top edge of the carton by means of a plunger before closing and sealing the flaps. However, this procedure has not been entirely successful since the compression of such products as soap flakes by a mechanical plunger often results in breaking the flakes and removing the crinkle therefrom so that the product does not reach the consumer in its natural condition. Moreover, undesirable shrinkage in the volume of the contents, as mentioned above, is still found to take place due, in part, to the fact that when a plunger is used it may in certain cases enter about two thirds of the way into the carton, thereby compressing and breaking up the contents in the lower third of the carton. When the plunger is extracted it draws with it from the lower third of the carton into the upper two thirds of the carton some of the product, thereby creating a condition in which the specific gravity of the product in the lower third of the carton differs materially from that in the upper two thirds. On subsequent handling of the carton before it reaches the consumer the tendency of the lighter product in the upper two thirds of the carton is to settle in more compact form, thus having an empty space at the top of the carton.

It is an object of the present invention to overcome the above mentioned disadvantages by filling the cartons, with the end and side flaps extending vertically from the top of the carton, to a level between the upstanding flaps and then closing the flaps to seal the carton thus putting the material under pressure without diminishing its resiliency. As a result when the package is opened it will tend to expand again to above the package level.

A second object is to provide new and improved apparatus which is simple in construction and reliable in operation for folding the end flaps of a carton inwardly to close them.

A third object is to provide apparatus for folding both end flaps simultaneously.

Another object is to press the quantity of material between the upstanding flaps into the body of the carton by means of the end flaps as they are folded inwardly.

A further object is to maintain the contents of the carton under compression by holding the end flaps in their closed positions until the side flaps of the carton have been sealed thereover.

Other objects and advantages of the invention will become apparent upon consideration of the following description and appended claims when read in conjunction with the accompanying drawings in which:

Figure 1 is a side elevation, partly in section, of that portion of the carton closing apparatus embodying the present invention;

Figure 2 is a top plan view of the apparatus shown in Figure 1;

Figures 3 to 7 are perspective views showing a carton at various stages in the closing operation;

Figure 8 is an enlarged view of a portion of the apparatus illustrated in Figure 1 and shows the end-flap closing apparatus;

Figure 9 is a top plan view corresponding to Figure 8;

Figure 10 is a sectional view similar to Figure 8 but illustrating the apparatus in another position; and

Figure 11 is a sectional view taken along the line 11—11 in Figure 10.

Referring particularly to Figures 1 and 2, the numeral 10 designates a continuously driven conveyor belt for carrying empty cartons to and filled cartons away from a filling station (not shown) where they receive a measured quantity of soap flakes or similarly bulky material. Each carton 11 reaches the filling station with the bottom sealed and the end and side flaps 12, 13 and 14, 15, respectively, at the top thereof extending vertically upwardly from the sides so that the carton may receive a quantity of soap flakes filling it to a level between the upstanding

flaps and above the score lines 16 about which these flaps are turned inwardly and downwardly to close and seal the carton, as illustrated in Fig. 3.

Guides 17, spaced at a distance slightly greater than the thickness of the cartons, extend along and above belt 10 and near their forward ends are inclined across the belt for directing the cartons laterally thereof to be advanced beyond guides 17 to a position in front of a reciprocatory offset-feed device. The offset-feed device removes the cartons in succession from belt 10 and delivers them to apparatus, designated as a whole by the numeral 39, which is provided for closing the end flaps 12, 13 and which is disposed in offset relation to the conveyor belt, as shown in Fig. 2.

The forward movement of each carton 11 by belt 10 is stopped by bars 18, 19 positioned to engage the forward end of each carton near the top and bottom thereof. Bars 18, 19 also serve to guide the cartons in their subsequent lateral movement by the offset-feed device which is disposed to reciprocate transversely of and above the conveyor belt. The offset-feed device comprises a member 20 fixed to a reciprocatory rod 21 and carrying a pusher plate 22 for moving a carton 11 off belt 10 onto a platform 23 located beneath the end flap closing apparatus 39 with the rear side face of the carton contacting a guide bar 24. Plate 22 has an angular extension 25 for closing the exit at the forward end of guides 17 to temporarily stop the advance of the following cartons, belt 10 slipping beneath the cartons whose forward movement therewith is thus inhibited.

The reciprocation of rod 21 is effected and controlled by a cam 26 on a cam shaft 27 through a mechanism shown in Figure 2 and hereinafter described, adapted to convert the rotary movement of shaft 27 into a reciprocatory movement for rod 21 and the offset-feed plate 22 actuated thereby. The offset-feed cam 26 does not effect continuous reciprocations of the offset-feed device but operates the latter only when the cam is tripped by a trigger 30. Trigger 30 extends adjacent bars 18, 19 and has one end positioned in the path of movement of a carton as it is advanced from guides 17 by belt 10 so that when a carton becomes positioned in front of offset-feed plate 22, trigger 30 is actuated by the carton to cause tripping of the mechanism actuated by cam 26 for effecting operation of the offset-feed device to transfer the carton to platform 23.

The trigger 30 is pivotally mounted on the framework of the apparatus and has a pawl 30a connected thereto spring biased in a clockwise direction, as viewed in Figure 2. Adjacent the pawl 30a is a pivotally mounted member 31a having a notch 32a normally engaging the pawl 30a. The member 31a also has a lever 33a attached thereto and movable therewith. Also mounted on the pivotal support for member 31a is a lever 34a having a notch 34b therein movable with respect to member 31a and attached through link 35a to cam 26, whereby rotation of cam 26 oscillates the lever 34a. The member 31a also carries pivotally mounted pawl 36a, which is biased in a clockwise direction by spring 37a tending to engage the end of pawl 36a in the notch 34b of lever 34a. Pawl 36a has an outwardly extending arm 36b which engages fixed pin 38a on the framework when the pusher plate 22 is retracted. The framework of the apparatus is provided with a bore 39a containing a spring-pressed plunger 40a acting as a shock absorbing means and also urging the member 31a in a clockwise direction. The lever 33a is connected by link 41a to the pusher rod 21. When a carton strikes the trigger 30, it is displaced, also moving pawl 30a out of notch 32a thereby permitting member 31a to rotate counterclockwise under the pressure exerted by plunger 40a, moving arm 36b out of engagement with pin 38a and swinging pawl 36a into the path of oscillating lever 34a where pawl 36a will engage notch 34b latching lever 34a to member 31a. Movement of lever 34a in a counterclockwise direction will rotate member 31a and lever 33a in a counterclockwise direction advancing pusher plate 22. Return of lever 34a in a clockwise direction will also return the pusher plate and actuating mechanism to their original positions preparatory to being released by contact of another carton with trigger 30.

Cam 26 is formed with a cam slot or the like arranged to vary the rate of reciprocatory movement of pusher plate 22 by rod 21. In transferring a carton from belt 10 to platform 23 the plate 22 is initially moved at a sufficiently slow speed to obviate jarring of the carton in order to prevent spilling the soap flakes that fill the carton to a level near the top edges of the upstanding flaps. At the end of its inward stroke to transfer a carton, pusher-plate 22 remains in contact therewith for an interval while the end flaps 12, 13 are being closed and its angular extension 25 is positioned to prevent advance of other cartons by belt 10. The return movement of pusher-plate 22 is at a more rapid rate to enable it to be positioned outwardly beyond guides 17 in sufficient time to transfer the following carton to platform 23 without undue delay as the plate 25 moving beyond the guides 17 permits belt 10 to position another carton in front of the pusher-plate 22 of the offset-feed device. Although a particular carton feeding device has been shown and described in detail, it should be understood that other types of feeding devices may be employed to position the cartons in succession beneath the device 39 for closing the end flaps.

The device 39 for closing the end flaps 12, 13 of a carton on platform 23 comprises a pivoted plate 40 which is slightly less in width than the space between the side flaps 14, 15. Plate 40 is mounted on a hinge 41, supported by an adjustable bracket 42 on the machine frame, so that the plate may be swung downwardly into contact with the end flap 12. A channel shaped member 43 comprising a plate 44 having side flanges 45 is carried by plate 41 for pivotal movement thereon in the direction opposite to the closing movement of plate 40. Plate 44 is adapted to engage the other end flap 13 and its width corresponds substantially to the space between the side flaps of a carton. The swinging movements of plates 40 and 44 are effected by means of a pitman rod 46 adjustably secured adjacent one end to a crank 47 fixed on a rock shaft 48 which is operated through a link rod 49 by a cam 50 on cam shaft 27.

Referring also to Figures 8–11, the bifurcated head of pitman rod 46 is connected by a wrist pin 51 to a lug on a slide 52 having edge portions extending beneath guides 53 secured to plate 40 and projecting partially over a longitudinal recess 54 formed in the upper face thereof to provide a track for the slide. A stop 55 secured to the enlarged head-portion 56 of plate 40 limits the rearward movement of slide 52. Pin 51 ex-

tends at each side of the head of pitman rod **46** into bearings on portions **45***a* of the flanges **45** of member **43** that extend beyond the forward end of plate **44**, as shown in Figs. 8 and 10, and which are disposed at each side of plate **40** for pivotally mounting member **43** on slide **52**.

A link rod **60** provided with a cross head for connecting it between the flanges **45** of member **43** is adjustably secured to a link block **61** pivotally mounted on a stud **62** supported by bifurcations or lugs **63** extending rearwardly from the head-portion **56** of plate **40**. Coil springs **64** bearing at their opposite ends on lugs **63** and link block **61** urge the latter counterclockwise to act in conjunction with springs **65**, connected between the flange extensions **45***a* and spring anchors on a clamp **66** secured to pitman rod **46**, for biasing the closer member **43** for the end flap **13** of a carton to the position shown in Figs. 1 and 8. An adjustable stop **69** is provided on bracket **42** for engagement by rod **46** to limit the downward movement of the closing device.

As best shown in Figs. 9 and 11, rods **70** carrying flared guide plates **71** for the side flaps of a carton are supported at their rearward ends in the head portion **56** of plate **40**. Rods **70** are supported in head **56** so that they extend forwardly along the sides of plate **40** in spaced relation thereto and to the flanges **45**, **45***a* of member **43** to provide a slot or channel for receiving the side flaps **14**, **15** of a carton positioned on platform **23** as plate **40** and member **43** swing downwardly against the top of the carton. A felt pad **72** having a width substantially corresponding to or slightly greater than the space between the side flaps is mounted on plate **40** by a retaining plate **73** secured to slide **52** forwardly of its connection to pitman rod **46** and is adapted to engage the inner side faces of the side flaps.

A conveyor chain **75** guided around a sprocket **76** to travel forwardly in spaced relation to the rear side face of a carton on platform **23** is provided at intervals with members **77** extending outwardly therefrom and adapted to engage the rearward end of a carton to carry it forwardly from the end-flap closing apparatus **39**. The spacing of members **77** along chain **75** and the rate of operation of the latter are such that a member **77** does not necessarily engage a carton **11** immediately after it has been laterally transferred to platform **23** from belt **10** by the offset-feed device but may engage the carton to advance it after the end-flap closing operation has been partially completed. The operations of conveyor chain **75** and flap closing device **39** are properly coordinated by suitable mechanism operating cam shaft **27** and the conveyor **75**. By this means the carton is not advanced from the closing station until the end flaps are at least substantially closed thus retaining the flakes within the package.

Guide bars **78**, **79** which may be integral angular extensions of the bars **18**, **19** are adapted to engage the front side of the carton and together with the bar **24** engaging the rear side of a carton guide it in its forward movement by chain **75**.

A plate **80** of a width to fit closely between the side flaps **14**, **15** is supported from bracket **42** and is vertically positioned to engage the closed end flaps **12**, **13** as the carton is moved forwardly for maintaining them closed until one of the side flaps has been sealed thereover to hold them in closed position. The carton is moved forwardly with its bottom guided on a track **81** which in the arrangement shown supports platform **23** with its upper face flush with the guide face **82** of the track.

Bracket **42** also supports a pair of plates **83**, one at each side of plate **80**, provided with suitable camming portions **84** positioned for turning the side flaps **14**, **15** downwardly and outwardly to a substantially horizontal position, as illustrated in Figure 5. Air under pressure is directed against the top of the cartons and side flaps **14**, **15** through an apertured pipe **85**, supported from bracket **42**, for removing any soap flakes from the side flaps and top of the carton to prevent flakes getting mixed with adhesive that is applied to the longitudinal edges of the side flaps as they pass under adhesive applying rolls **86**.

Beyond the rolls **86** are plates **87**, **88** having camming faces adapted to turn the side flaps **14**, **15**, respectively, upwardly and slightly inwardly, as illustrated by the position of flap **15** in Figure 6, into position to be engaged by related series of inclined flap closing and sealing rollers **89**, **90**. The respective rollers of each series have their axes inclined at various angles approaching the horizontal across the path of movement of the top of the carton for turning the side flaps **14**, **15** downwardly and pressing them against the end flaps to seal the carton.

The operation is as follows:

Conveyor belt **10** carries the cartons loosely filled to a level near the top edges of the flaps, forwardly to position them in succession in front of the offset-feed device where the foremost carton is brought to rest by bars **18**, **19** engaging its forward end. The carton engaging trigger **30** actuates the latter to trip cam **26** for effecting reciprocation of the offset-feed device. Pusher plate **22** of the offset-feed device then engages the front side of the carton and moving inwardly, at a rate to obviate jarring the carton and spilling the soap flakes therefrom, transfers the foremost carton from belt **10** to platform **23** while plate **25** carried with the pusher plate closes the exit at the forward end of guides **17** to temporarily prevent forward movement of the following carton with belt **10**.

Cam **50** then acts on rod **49** to turn rock shaft **48** clockwise moving pitman rod **46** downwardly to swing closing device **39** toward the top of the carton on platform **23**. As the closing device is swung downwardly the flared plates **71** carried by the rods **70** engage the upstanding side flaps **14**, **15** and guide them into the channels between rods **70** and the side flanges **45** of member **43**, as illustrated in Figs. 10 and 11, to hold them in vertical positions out of the way of plate **40** and member **43** carried thereby. As the lower end of pitman rod **46** moves downwardly and forwardly in a clockwise arc, slide **52** connecting the rod to plate **40** is drawn forwardly in its track **53**, **54** on the latter pivoting plate **40** downwardly in a clockwise direction about its hinge **41** into engagement with the end flap **12** for turning the later inwardly and downwardly to close it. As slide **52** moves forwardly, member **43** mounted thereon is carried forwardly along plate **40** and the plate portion **44** thereof engages the other end flap **13**. Since member **43** is restrained at its rearward end by link rod **60** which connects it to plate **40**, it is caused to pivot counterclockwise, against the biasing action of springs **64** and **65**, about its fulcrum **51** moving along plate **40** so that upon engaging the end flap **13** it turns the latter inwardly and downwardly to close it also.

The simultaneous pivoting movements of closer plate 40 and the closer plate 44 of member 43 in opposite directions as they are brought into contact with the end flaps 12, 13, respectively, turns both flaps inwardly and downwardly at the same time and causes the soap flakes located between the upstanding flaps to be pressed downwardly into the body of the carton and compressed by the end flaps 12, 13 as they are closed. The side flaps 14, 15 which are held vertically between rods 70 and the side flanges 45 of member 43 guide the soap flakes into the body of the carton and prevent their being forced or spilled over the sides. As shown in Fig. 8 plate 44 is provided with perforations permitting the escape of air that may be expressed as the flakes are compressed in the carton. As plates 40 and 44 swing downwardly in unison against the top of the carton the felt pad 72 engages the inner faces of the side flaps and thus occupying the space therebetween prevents flakes being expelled from the top of the carton, and as it is drawn forwardly with slide 52 it becomes positioned, Fig. 10, to wipe stray flakes off the side flaps as the latter bear against the felt when the carton is moved forwardly.

When the end flaps are partially closed the operation of conveyor chain 75 brings a member 77 thereon into contact with the rear end of the carton for advancing it from beneath closing device 39. Since the rods 70 extending forwardly along the sides of plate 40 are supported only at their rearward ends, in head portion 56, the carton may be moved forwardly without interference as the side flaps are free to move out of the channels between rods 70 and plate 40.

Pusher plate 22 of the offset-feed device is maintained positioned against the front side of the carton holding it against the guide bar 24 as flaps 12, 13 are closed. The offset-feed device is then operated by cam 26 to return pusher plate 22 quickly to its outer position for transferring another carton to platform 23 and plate 25 is moved outwardly therewith from across guides 17 to permit belt 10 to position the following carton in front of the offset-feed device.

As end flap 13 is moved from contact with plate 44 of member 43 it engages plate 40 which holds both flaps 12 and 13 closed and as the carton is advanced from beneath the closing device 39 the end flaps become engaged with the stationary plate 80 which fits closely between the side flaps and bears against the end flaps to hold them in their closed positions.

Cam 50 acts through rod 49 to turn rock shaft 48 counterclockwise swinging the flap closing device 39 upwardly. Springs 65 connected to the side flange extensions 45a and springs 64 acting through link block 61 and rod 60 pivot closer member 43 clockwise as slide 52 is drawn rearwardly by the lower end of pitman rod 47. Thus, both closer plates 40 and 43 are returned to the position illustrated in Figs. 1 and 8 in preparation for closing the end flaps of the following carton.

As conveyor 75 advances the carton its side flaps 14, 15 engage the camming faces 84 of plates 83 so that they are turned outwardly and downwardly to horizontal portions, Fig. 5, to pass beneath the rolls 86 to receive adhesive adjacent their side edges. Subsequently, flap 14 on engaging plate 87 is turned upwardly and slightly inwardly into position to pass beneath the inclined rollers 89 which turn the flap down and press it against the end flaps as the carton advances, as illustrated in Fig. 6. As shown in Figs. 1 and 2, stationary plate 80 which fits over the end flaps to hold them closed extends forwardly far enough beneath rollers 89 to hold these flaps closed until they are sealed by flap 14. The plate 88 and rolls 90 turn flap 15 upwardly and then over the flap 14, as shown in Fig. 7, to complete the sealing of the carton.

Although a carton receives a quantity, for example, of loose soap flakes or other bulking material filling it to a level between the upstanding flaps this quantity need not exceed the usual weight of material which the carton is intended to contain inasmuch as the soap flakes are put in the carton in their natural crinkly and unbroken form and thus bulk to a volume sufficient to fill the carton as described. Due to the fact that the flakes are not crushed before closing the flaps by a plunger operating under heavy pressure but are gently pressed down without crushing into the carton by the end flaps as the latter are folded inwardly, they remain substantially in their natural unbroken state, and due to their relatively resilient nature tend to resume their original condition when the flaps are opened.

The compression of the flakes by the end flaps causes the carton to bulge slightly at the sides and because the flaps are held fully closed by plate 80 until a side flap has been sealed thereover, the carton is fully closed and sealed in this condition. As a result, the usual settling of the flakes due to natural readjustments or to jarring of the cartons in transit does not manifest itself as a shrinkage in volume of the contents to a level objectionably below the top of the carton but results in relieving the flakes to a degree from the compressing action of the flaps. In fact it has been found that cartons filled and sealed by apparatus constructed in accordance with the invention often reach the consumer with the flakes still under sufficient compression so that when the flaps are opened the contents bulge slightly from the top of the carton with the result that the consumer receives the more favorable impression that the carton has been over-filled. Moreover, the contents of the carton are less subject to breakage due to abrasion of one particle with another and to shaking on handling because when the carton does not have an empty space at the top, but is full and its contents under pressure, the contents of the carton are less likely to move about.

Although a specific embodiment of the invention has been described in detail, there are many changes and variations which may be made without departing from the invention and, therefore, it is desired and intended to include all such changes and variations within the scope of the following claims.

I claim:

1. Apparatus for closing flaps at opposite edges of the top of a carton comprising movable means operable to engage one flap for folding it inwardly to closed position; and means carried by said first means and movable relatively thereto and engageable with the opposite flap for folding it inwardly to closed position.

2. Apparatus for closing flaps at opposite edges of the top of a carton comprising means operable to engage the flap at one end of the carton for folding it inwardly to closed position; means carried by said first means and movable therealong for engaging the other end flap; and means associated with said second means for restrain-

ing its movement along said first means to cause it to pivot thereon for folding the other end flap inwardly.

3. Apparatus for closing flaps at opposite edges of the top of a carton comprising flap closing means movable about a stationary pivot for engaging the flap at one end of a carton to fold it inwardly; flap closing means movable about a shifting pivot to engage the opposite end flap to fold it inwardly; and means for operating said closing means in unison to fold both flaps inwardly simultaneously.

4. Apparatus for closing flaps at opposite edges of the top of a carton comprising flap closing means movable about a stationary pivot for engaging the flap at one end of a carton to fold it inwardly; flap closing means movable about a shifting pivot on said first means to engage the opposite end flap; and means connected to said second flap closing means for restraining its movement along said first means to cause it to pivot thereon for engaging the other end flap to fold it inwardly .

5. Apparatus for closing flaps at opposite edges of the top of a carton comprising flap closing means movable about a stationary pivot for engaging the flap at one end of a carton to fold it inwardly; a slide movable along said means towards the pivot thereof; and flap closing means pivoted on said slide for engaging the other end flap to fold it inwardly.

6. Apparatus for closing flaps at opposite edges of the top of a carton comprising flap closing means movable about a stationary pivot for engaging the flap at one end of a carton to fold it inwardly; a slide movable along said means towards the pivot thereof; flap closing means pivoted on said slide for engaging the other end flap to fold it inwardly; and operating means connected to said slide for pivoting said closing means in opposite directions for simultaneously folding the end flaps of a carton inwardly.

7. Apparatus for closing the flaps at opposite end edges at the top of a carton filled with loose bulky material to a level between the upwardly extending end and side flaps thereof comprising a pair of oppositely movable members each engageable with one of the end flaps; means for simultaneously moving said members toward the top of the carton for engaging and folding the end flaps inwardly in unison to compress the material between the upstanding flaps into the body of the carton and to close the end flaps; and means for holding the flaps at opposite side edges of the carton in substantially vertical positions to prevent spilling the material from the top of the carton during the closing of the end flaps.

8. Apparatus for closing flaps at opposite end edges of the top of a carton filled with loose bulky material to a level between the upwardly extending end and side flaps thereof comprising a pair of oppositely movable members each engageable with one of the end flaps; means for simultaneously moving said members toward the top of the carton for engaging and folding the end flaps inwardly in unison to compress the material between the upstanding flaps into the body of the carton and to close the end flaps; means for holding the flaps at opposite side edges of the carton in substantially vertical positions to prevent spilling the material from the top of the carton during the closing of the end flaps; means for closing and sealing the side flaps in succession over the closed end flaps; and means fitting closely between the side flaps and extending over the end flaps in engagement therewith for holding them in closed position until a side flap is sealed thereover to complete sealing of the carton with the material therein under compression.

9. A device for closing the flaps extending upwardly from opposite edges at the top of a carton comprising; a carton support; a flap closing plate pivotally mounted above said support and positioned to be swung downwardly aganst the top of a carton on said support; a slide mounted on said plate; operating means connected to said slide for moving it along said plate toward the pivot thereof for pivoting said plate downwardly into engagement with the flap at one edge of the carton to fold it inwardly to closed position; a second flap closing plate pivotally mounted on said slide; and means connected to said second closer plate for restraining its movement with said slide to cause it to pivot thereon in a direction opposite to the movement of said first plate into engagement with the flap at the opposite edge of said carton for folding it inwardly to closed position.

10. A device for closing flaps extending upwardly from opposite edges of the top of a carton comprising; a carton support; a flap closing plate pivotally mounted above said support and positioned to be swung downwardly against the top of a carton on said support; a slide mounted on said plate; operating means connected to said slide for moving it along said plate toward the pivot thereof for pivoting said plate downwardly into engagement with the flap at one edge of the carton to fold it inwardly to closed position; a second flap closing plate pivotally mounted on said slide; and means connecting said plates for restraining the movement of said second plate with said slide to cause it to pivot thereon in a direction opposite to the movement of said first plate into engagement with the flap at the opposite edge of said carton for folding it inwardly to closed position.

11. In a carton closing and sealing apparatus having means for applying adhesive to the flaps along the side edges at the top of a carton and means for folding said flaps inwardly in succession and sealing them over previously closed end flaps of the carton; means for closing the end flaps of the carton comprising a pair of oppositely movable members each engageable with one of the end flaps; means for simultaneously moving said members toward the top of the carton for engaging the end flaps and folding them inwardly in unison to closed position; means engaging the side flaps for holding them in substantially vertical positions during closing of the end flaps; and means fitting closely between the side flaps to completely overlie the end flaps in engagement therewith and extending from the end flap closing means beyond the adhesive applying means to said side flap closing means for holding the end flaps in closed position until a side flap is sealed thereover.

12. A device for closing flaps of a carton having the flaps at its end and side edges extending upwardly from the top thereof comprising a carton support; a closer plate pivotally mounted above said support and positioned to be swung downwardly between the upstanding side flaps of a carton on said support into engagement with one end flap of the carton for folding it inwardly to closed position; a slide mounted on said plate; a second closer plate pivotally mounted on said slide; operating means for said closer plates; means for restraining the movement of said

second closer plate with said slide to cause it to pivot thereon to engage the other end flap of the carton and fold it inwardly to closer position, a carton when positioned on said support containing material filling it to a level between the upstanding end and side flaps thereof and the closing of said end flaps by said plates pressing said material into the carton; and means extending along said first closer plate and disposed in spaced relation to each side edge thereof for holding the side flaps of the carton positioned to prevent spilling of material from the sides of a carton during closing of the end flaps.

13. A device for closing flaps of a carton having the flaps at its end and side edges extending upwardly from the top thereof comprising a carton support; a closer plate pivotally mounted above said support and positioned to be swung downwardly into engagement with one end flap of the carton for folding it inwardly to closed position; a slide mounted on said plate; a second closer plate pivotally mounted on said slide; means for restraining the movement of said second closer plate with said slide to cause it to pivot thereon to engage the other end flap of the carton and fold it inwardly to closed position; operating means for said closer plates; and spaced means extending along opposite side edges of said plates for engaging opposite faces of the side flaps of a carton to hold them positioned out of the path of movement of said plates in closing the end flaps.

14. A device for closing flaps of a carton having the flaps at its end and side edges extending upwardly from the top thereof comprising a carton support; a closer plate pivotally mounted above said support and positioned to be swung downwardly into engagement with one end flap thereof for folding it inwardly to closed position; a second closer plate pivotally mounted to engage the opposed end flap of the carton and fold it inwardly to closed position; operating means for said closer plates; flanges on opposite side edges of said second closer plate, a pair of rods, each supported at one end thereof by said first closer plate and extending therealong in spaced relation to said flanges for forming channels to receive the side flaps of a carton; and guiding means carried by said rods for directing the side flaps of a carton into said channels when said closer plates are swung downwardly to close the end flaps.

15. Apparatus for closing the flaps at opposite end edges at the top of a carton filled with loose bulky material to a level between the upwardly extending end and side flaps thereof comprising a pair of oppositely movable members each engageable with one of the end flaps; means for simultaneously moving said members toward the top of the carton for engaging and folding the end flaps inwardly in unison to compress the material between the upstanding flaps into the body of the carton and to close the end flaps; means for holding the flaps at opposite side edges of the carton in substantially vertical positions to prevent spilling the material from the top of the carton during the closing of the end flaps; means for applying adhesive to the side flaps to seal the carton when the side flaps are folded over the end flaps; and an air jet intermediate said end flaps closing means and said adhesive applying means for removing stray material from said flaps to prevent admixture with the adhesive.

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